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FEDERAL SERVICE
UNDER THE INTELLECTUAL
PROPERTY,
PATENTS AND TRADE MARKS
(ROSPATENT)

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(12) **DESCRIPTIONS OF INVENTION**

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(54) **FREE NEUTRON PRODUCTION PROCESS**

FIELD: nuclear physics. SUBSTANCE: production of free neutrons involves use of cold fusion phenomenon in sorption-desorption of deuterium in metals. Used as metals are elements or alloys forming two crystalline phases existing in equilibrium within certain ranges of pressure and temperature, having different deuterium content and being isostructural to each other, such as palladium, niobium, vanadium, rare earth elements, intermetal compounds TiFe and TiCr₂. Metal is prepared in the form of powder with fragmentation size lower than 1 mm, thin foil, film applied to substrate, wire, or compact mass with pores and microcracks, with maximum possible total surface area. Sorption is conducted at deuterium pressure higher than pressure of three-phase equilibrium of isostructural phases with gas at desired temperature lower than critical value; desorption is conducted in two-phase equilibrium area of crystalline phase with gas at pressure lower than critical value for equilibrium of isostructural phases. Cycle is repeated many times. Energy of free neutrons is converted into coolant thermal energy. EFFECT: acceleration of cold fusion process by several orders of magnitude, facilitated and safe use of released energy. 11 cl, 5 dwg, 1 tbl

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